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Glacier Bay Intertidal and Subtidal Zones

Intertidal Zone

With tidal fluctuations as large as 25 vertical feet, Glacier Bay exhibits some of the largest tidal extremes in the world. Visitors to the park will notice dramatic difference between high and low tides. One minute you can be gazing out over 100 yards of mud flats and six hours later the waves can be lapping at your toes.

That area between high and low tides – known as the intertidal zone – is an extremely complex and important biological community and a fun place to explore. Lower portions of the intertidal zone are dominated by marine organisms such as algae and kelp, invertebrates and **fishes** (<https://www.nps.gov/glba/learn/nature/fish.htm>). Grazers like sea urchins, predators like sea stars and dogwinkles, and space dominators like rockweed, barnacles, and mussels are some of the dominant members that strongly influence this community's structure.

The Intertidal Life of Bartlett Cove (<https://www.nps.gov/glba/learn/nature/intertidal-life.htm>)

A guide to the wonders of Glacier Bay's Intertidal Zone

Organisms that live in this area need to be able to move or they need to be able to survive long periods of time out of the water when the tide is low. During such times they are exposed to heat from the sun and risk being eaten hungry animals.

Grasses and sedges colonize the area immediately above the intertidal zone in areas where they find enough stable soil to grow. Because they contain highly nutritious plants, flowers, and berries, these meadows are important food sources for animals. In fact, sedge meadows are perhaps THE most important single habitat type in the park for **bears** (<https://www.nps.gov/glba/learn/nature/bears-at-glacier-bay.htm>). The absence of large trees and tangled underbrush makes beach meadows ideal for travel, and they serve as important thoroughfares for everything from mink to bears to people.

Steep headlands and exposed rocky shores tend to host intertidal species that attach themselves to rocks, such as barnacles, anemones and tubeworms, as well as a variety of marine algae and kelps. Embayments where the waters are calmer accumulate sediments that are home to many burrowing creatures, such as clams and worms. These rocky and sedimentary communities each provide important foraging habitat for terrestrial and marine animals. Virtually every animal that lives in Glacier Bay has been seen feeding in the intertidal zone – even mountain goats and shrews!

Subtidal Zone

Where the water is relatively free of suspended particles, sunlight can penetrate the water surface to a depth of over 100 feet. Shallow subtidal communities in this photosynthetic zone may be dominated by dense aggregations of kelp in some areas. These **"kelp forests"** (<https://www.nps.gov/glba/learn/education/kelp-forest-background.htm>) provide critical nursery areas for numerous invertebrates and marine fishes. They are also key

foraging areas for [sea otters \(https://home.nps.gov/glba/learn/nature/sea-otters-in-glacier-bay.htm\)](https://home.nps.gov/glba/learn/nature/sea-otters-in-glacier-bay.htm), [seals \(https://www.nps.gov/glba/learn/nature/harbor-seals-in-glacier-bay.htm\)](https://www.nps.gov/glba/learn/nature/harbor-seals-in-glacier-bay.htm), many diving birds, and schools of [adult salmon \(https://www.nps.gov/glba/learn/nature/salmon-identification.htm\)](https://www.nps.gov/glba/learn/nature/salmon-identification.htm). The productivity of these communities – that is, their growth rate and food content – may be the greatest of any in the park. Kelp forests are not found in the glacially influenced areas near the glaciers because the bottom is often too silty for the kelp to find purchase, and the amount of sediments in the water makes it difficult for photosynthesis to take place.

On rocky fjord walls, submarine moraine crests, and current-scoured areas, the fauna is dominated by a variety of attached filter-feeding organisms that include corals, hydroids, sea pens, sponges, sea anemones, barnacles, scallops and mussels. These animals take water into their bodies and filter out water-borne detritus and dissolved organic matter, and in turn provides the base of a food web that includes species such as sculpins, shrimps, flatfish and (in the southern part of Glacier Bay and Icy Strait) rockfish and greenlings. Current-scoured areas in the mid-bay area are considered prime real estate, as kelp and algae can grip the bottom and grow. It is here you will find the greatest diversity of kelps and algae and these areas are especially known for being rich and productive feeding areas for marine life.

Sedimentary marine basins of the mid-bay host major populations of king, [Dungeness \(https://www.nps.gov/articles/glba-dungeness-crabs.htm\)](https://www.nps.gov/articles/glba-dungeness-crabs.htm), and Tanner crabs, flatfishes, cods, and eelpouts on the bottom surface and large populations of worms and small crustaceans within the sediments. Closer to the glaciers, less densely occupied communities are dominated by shrimps, smaller crustaceans, other arthropods, and worms. These invertebrates survive on nutrients transported to depth via a phenomenon called "marine snow." Organic materials suspended in the water column near the surface clump together and eventually sink to the bottom. These clumps of "snow" continuously drift down from the surface waters, delivering nutrients to the deep- water organisms. Thus sustained, crustaceans and the fishes that eat them survive and become a key prey base for seabirds and marine mammals throughout the year.

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